

EXHIBIT F

Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find

	Evidence
1. A mobile phone system, comprising:	<p>Samsung provides mobile phones, such as the Samsung Galaxy S22 5G. https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php.</p>
(a) a Bluetooth radio frequency transceiver;	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include a Bluetooth radio frequency transceiver.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Samsung documentation advertises that "With the SmartThings Find service, you can easily locate your missing device even if it's offline...Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices" (excerpted from Ref. 2). As a reminder, in this context, the arrangement of letters "BLE" is an acronym for "Bluetooth Low Energy" (see, <i>e.g.</i>, Ref. 2).</p> <p>A variety of Samsung Galaxy products have Bluetooth capability. As only a few examples, it has been revealed that both the "Samsung Galaxy Note20 5G" (Ref. 1) and the "Galaxy Note20 Ultra 5G" (Ref. 1) include Bluetooth connectivity (see, <i>e.g.</i>, Ref. 1); <i>see also</i> https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php (describing the Bluetooth functionality of the Samsung Galaxy S22 5G).</p> <p>In fact, Samsung has explained that "SmartThings Find uses Bluetooth Low Energy (BLE)...to help people find select Galaxy smartphones, tablets, smartwatches and earbuds" (excerpted from Ref. 2) (parenthetical insertion in the original).</p>

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(b) a cellular wireless transceiver;	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include a cellular wireless transceiver.</p> <table><tr><td>NETWORK</td><td><u>Technology</u></td><td>GSM / CDMA / HSPA / EVDO / LTE / 5G</td></tr></table> <p>https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php.</p>	NETWORK	<u>Technology</u>	GSM / CDMA / HSPA / EVDO / LTE / 5G												
NETWORK	<u>Technology</u>	GSM / CDMA / HSPA / EVDO / LTE / 5G														
(d) a graphic display; and	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include a graphic display.</p> <table><tr><td>DISPLAY</td><td><u>Type</u></td><td>Dynamic AMOLED 2X, 120Hz, HDR10+, 1300 nits (peak)</td></tr><tr><td></td><td><u>Size</u></td><td>6.1 inches, 90.1 cm² (~87.4% screen-to-body ratio)</td></tr><tr><td></td><td><u>Resolution</u></td><td>1080 x 2340 pixels, 19.5:9 ratio (~425 ppi density)</td></tr><tr><td></td><td><u>Protection</u></td><td>Corning Gorilla Glass Victus+</td></tr><tr><td></td><td></td><td>Always-on display</td></tr></table> <p>https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php.</p>	DISPLAY	<u>Type</u>	Dynamic AMOLED 2X, 120Hz, HDR10+, 1300 nits (peak)		<u>Size</u>	6.1 inches, 90.1 cm ² (~87.4% screen-to-body ratio)		<u>Resolution</u>	1080 x 2340 pixels, 19.5:9 ratio (~425 ppi density)		<u>Protection</u>	Corning Gorilla Glass Victus+			Always-on display
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(e) at least one automated processor configured to:	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor.</p> <table><tr><td>PLATFORM</td><td><u>OS</u></td><td>Android 12, upgradable to Android 13, One UI 5.1</td></tr><tr><td></td><td><u>Chipset</u></td><td>Exynos 2200 (4 nm) - Europe Qualcomm SM8450 Snapdragon 8 Gen 1 (4 nm) - ROW</td></tr><tr><td></td><td><u>CPU</u></td><td>Octa-core (1x2.8 GHz Cortex-X2 & 3x2.50 GHz Cortex-A710 & 4x1.8 GHz Cortex-A510) - Europe Octa-core (1x3.00 GHz Cortex-X2 & 3x2.50 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510) - ROW</td></tr><tr><td></td><td><u>GPU</u></td><td>Xclipse 920 - Europe Adreno 730 - ROW</td></tr></table>	PLATFORM	<u>OS</u>	Android 12, upgradable to Android 13, One UI 5.1		<u>Chipset</u>	Exynos 2200 (4 nm) - Europe Qualcomm SM8450 Snapdragon 8 Gen 1 (4 nm) - ROW		<u>CPU</u>	Octa-core (1x2.8 GHz Cortex-X2 & 3x2.50 GHz Cortex-A710 & 4x1.8 GHz Cortex-A510) - Europe Octa-core (1x3.00 GHz Cortex-X2 & 3x2.50 GHz Cortex-A710 & 4x1.80 GHz Cortex-A510) - ROW		<u>GPU</u>	Xclipse 920 - Europe Adreno 730 - ROW			
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	<p><u>OS</u> Android 12, upgradable to Android 13, One UI 5.1</p> <p>https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php.</p>
<p>(i) control the Bluetooth radio frequency transceiver to automatically directly receive at least an identifier of an adjacent mobile wireless communication device;</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to control the Bluetooth radio frequency transceiver to automatically directly receive at least an identifier of an adjacent mobile wireless communication device.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Samsung documentation advertises that "With the SmartThings Find service, you can easily locate your missing device even if it's offline...Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices" (excerpted from Ref. 2). As a reminder, in this context, the arrangement of letters "BLE" is an acronym for "Bluetooth Low Energy" (see, <i>e.g.</i>, Ref. 2).</p> <p>A variety of Samsung Galaxy products have Bluetooth capability. As only a few examples, it has been revealed that both the "Samsung Galaxy Note20 5G" (Ref. 1) and the "Galaxy Note20 Ultra 5G" (Ref. 1) include Bluetooth connectivity (see, <i>e.g.</i>, Ref. 1); <i>see also</i> https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php (describing the Bluetooth functionality of the Samsung Galaxy S22 5G).</p> <p>In fact, Samsung has explained that "SmartThings Find uses Bluetooth Low Energy (BLE)...to help people find select Galaxy smartphones, tablets, smartwatches and earbuds" (excerpted from Ref. 2) (parenthetical insertion in the original).</p>

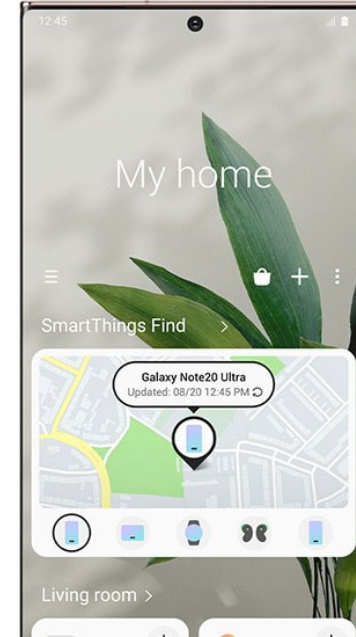
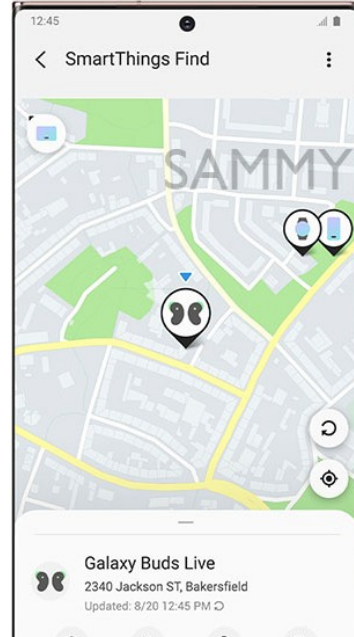
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	<p>“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
(ii) automatically generate a record of the received identifier, along with a time and the global location of the	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically generate a record of the received identifier, along with a time and the global location of the mobile phone system automatically determined by the global positioning system device.</p> <p>This is evidenced, for example, by the fact that a Samsung mobile phone can alert the Samsung server about the location of detected off-line devices.</p>

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<p>mobile phone system automatically determined by the global positioning system device;</p>	<p>Easily Find More of Your Devices</p> <p>After completing a quick registration process, SmartThings users can easily find their Galaxy devices – from smartphones, tablets and smartwatches, down to each individual earbud. Whether you dropped your Galaxy Note20 Ultra behind the sofa, can't remember where you stashed your Galaxy Buds Live, or left your Galaxy Watch3 somewhere so secure you can't find it, the SmartThings Find service will help you keep more of your Galaxy devices safe through the easy-to-use SmartThings app.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p>
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Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find



Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans

The SmartThings Find technology reports the identification of the specific object being sought, the time that it was found, and the location that this lost object occupies (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). For instance, it has been written that "Samsung customers quickly locate registered Galaxy devices" (Ref. 4). Clearly, in order for the registration to be useful, it must necessarily include the identification of the lost object.

In addition, the SmartThings Find technology indicates the time that the object was located. For example, in a screen shot included with Reference 5, notice that the time indicated is 12:45 PM on August 20th.

And, the SmartThings Find technology indicates the location of the lost object. In the example discussed immediately above, the screen shot indicates that the location of the lost item is 2340 Jackson Street in Bakersfield.

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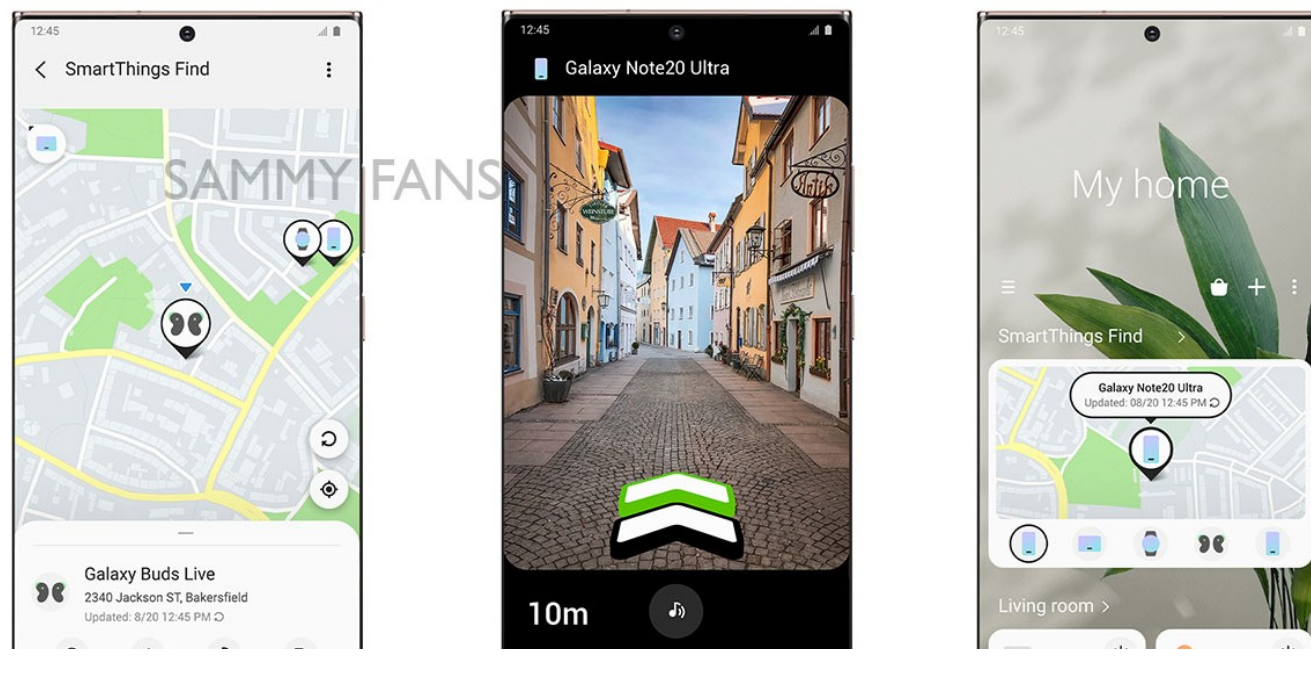
	<p>“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" add-on which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
(iii) automatically transmit the record to a remote automated searchable database through the	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically transmit the record to a remote automated searchable database through the cellular wireless transceiver.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy</p>

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cellular wireless transceiver;

smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.

Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom



Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans

As detailed earlier in this patent claim chart, the SmartThings Find technology reports the identification of the specific object being sought, the time that it was found, and the location that this lost object occupies (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). For instance, it has been written that "Samsung customers quickly locate registered Galaxy devices" (Ref. 4). Clearly, in order for the registration to be useful, it must necessarily include the identification of the lost object.

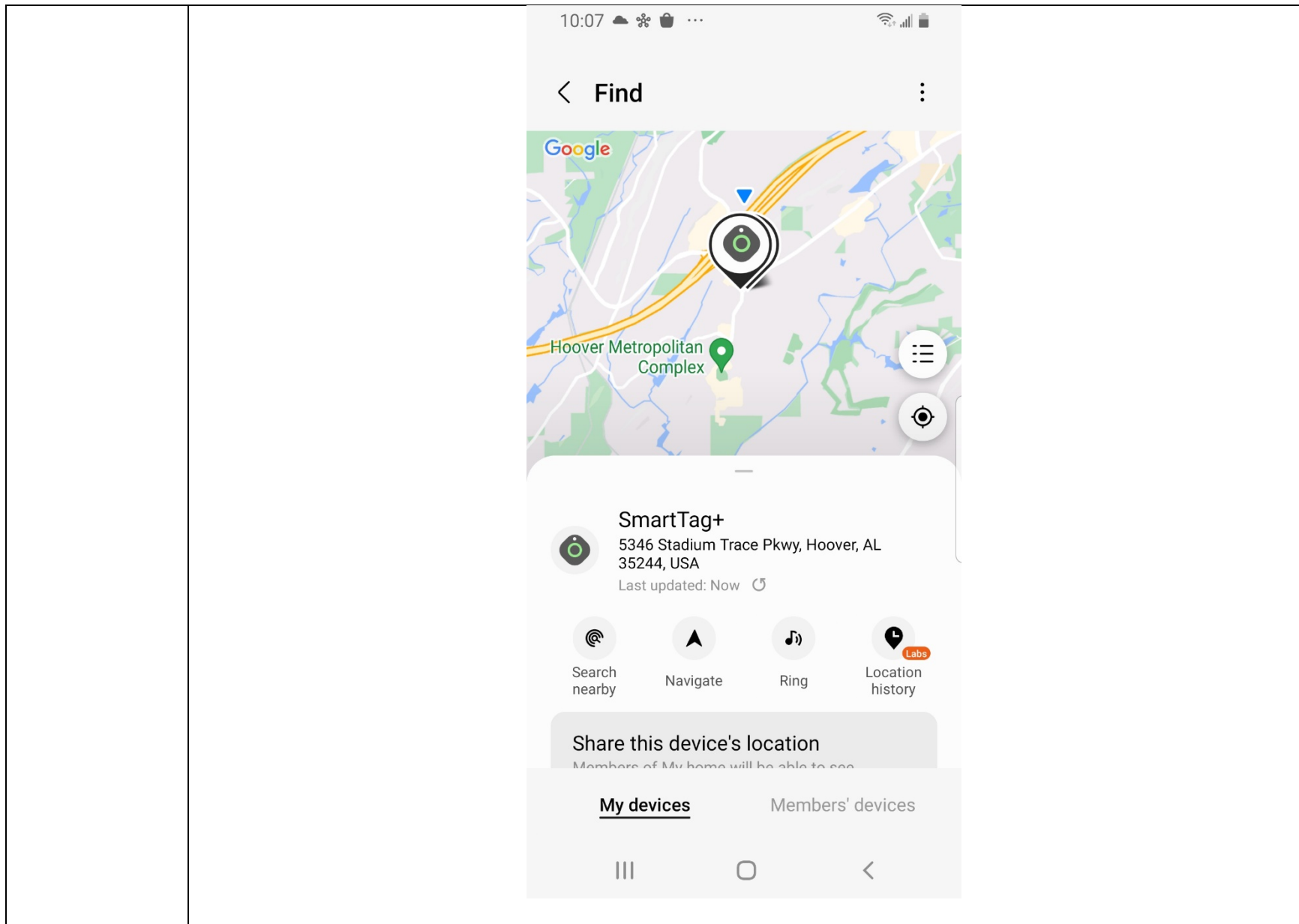
Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find

	<p>In addition, the SmartThings Find technology indicates the time that the object was located. For example, in a screen shot included with Reference 5, notice that the time indicated is 12:45 PM on August 20th.</p> <p>And, the SmartThings Find technology indicates the location of the lost object. In the example discussed immediately above, the screen shot indicates that the location of the lost item is 2340 Jackson Street in Bakersfield.</p> <p>“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" add-on which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
(iv) automatically	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically communicate information from the mobile phone system to the remote automated</p>

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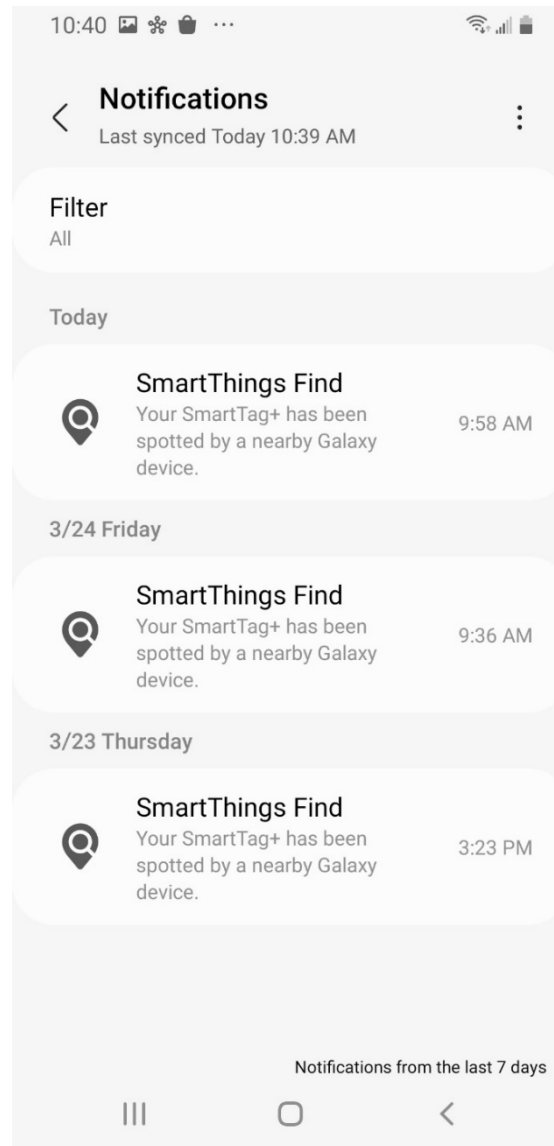
communicate information from the mobile phone system to the remote automated searchable database through the cellular wireless transceiver to search at least global locations associated with records stored in the remote automated searchable database;	<p>searchable database through the cellular wireless transceiver to search at least global locations associated with records stored in the remote automated searchable database.</p> <p>For example, when someone uses a Samsung Galaxy phone to associate a Samsung SmartTag with the phone, the phone will then communicate information to the Samsung database to search global locations associated with records stored in the remote automated searchable database. This is evidenced by the fact that the location of the SmartTag is displayed on the user's device.</p>
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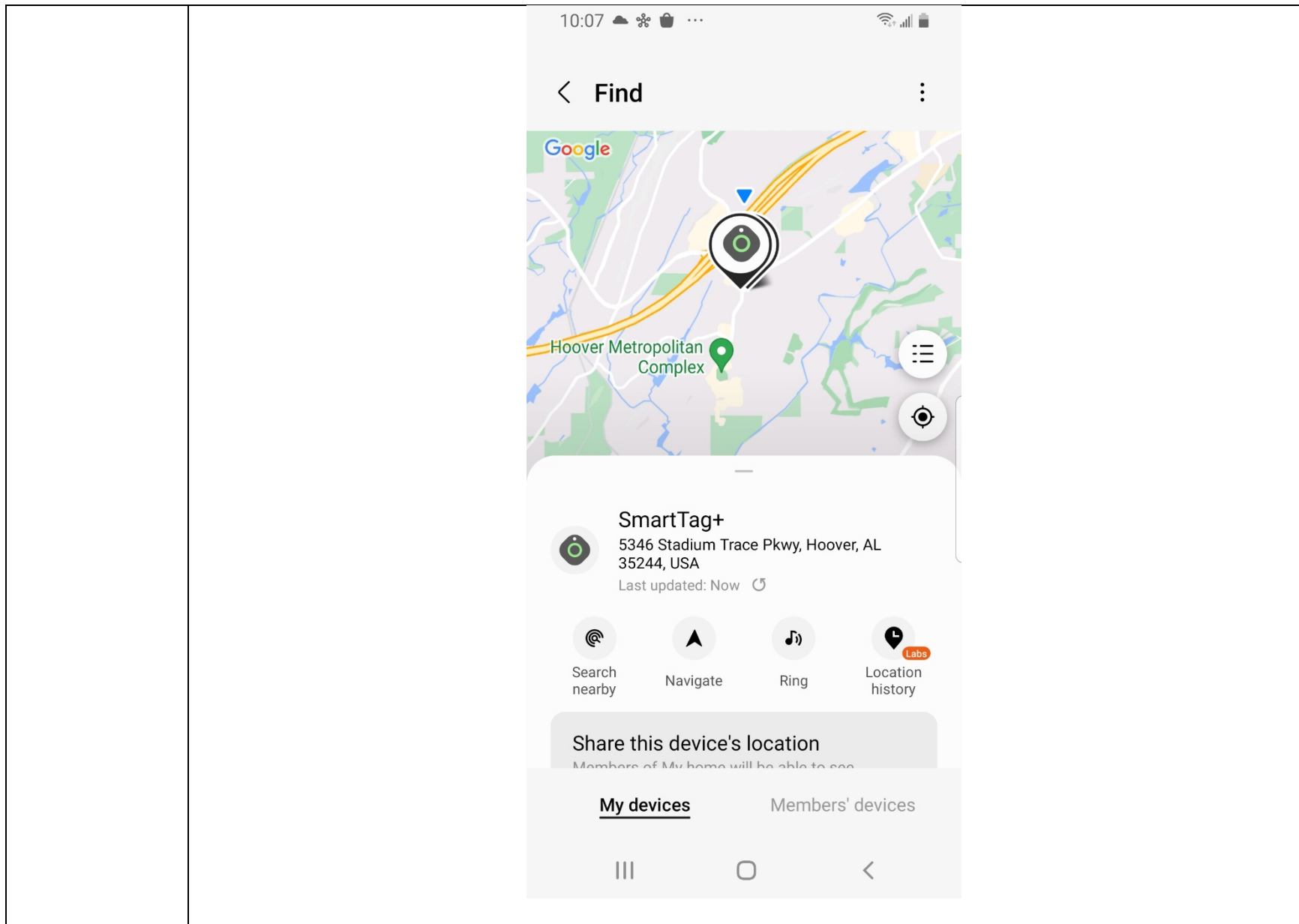
Moreover, the phone can receive notifications when a different device has spotted the tag.



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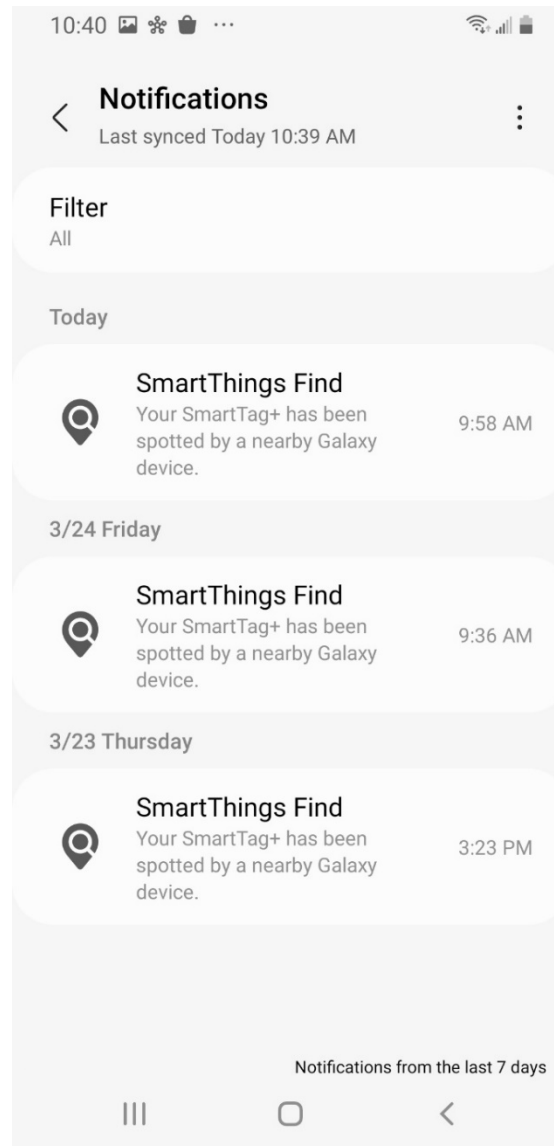
	<ul style="list-style-type: none"> • Notify when left behind - Enable this to receive a notification when the device is far away from your phone • Notify me when it's found - Enable this to get a notification when that device is anonymously detected by a member of the SmartThings Find community <p>https://support.smarthings.com/hc/en-us/articles/10863369660052-SmartThings-Find</p>
(v) automatically receive information about an event along with a time and global location of the event from the remote automated searchable database through the cellular wireless transceiver responsive to the automatically communicated information;	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically receive information about an event along with a time and global location of the event from the remote automated searchable database through the cellular wireless transceiver responsive to the automatically communicated information.</p> <p>For example, when someone uses a Samsung Galaxy phone to associate a Samsung SmartTag with the phone, the phone will receive information about events, including a time and location, from the Samsung database.</p>

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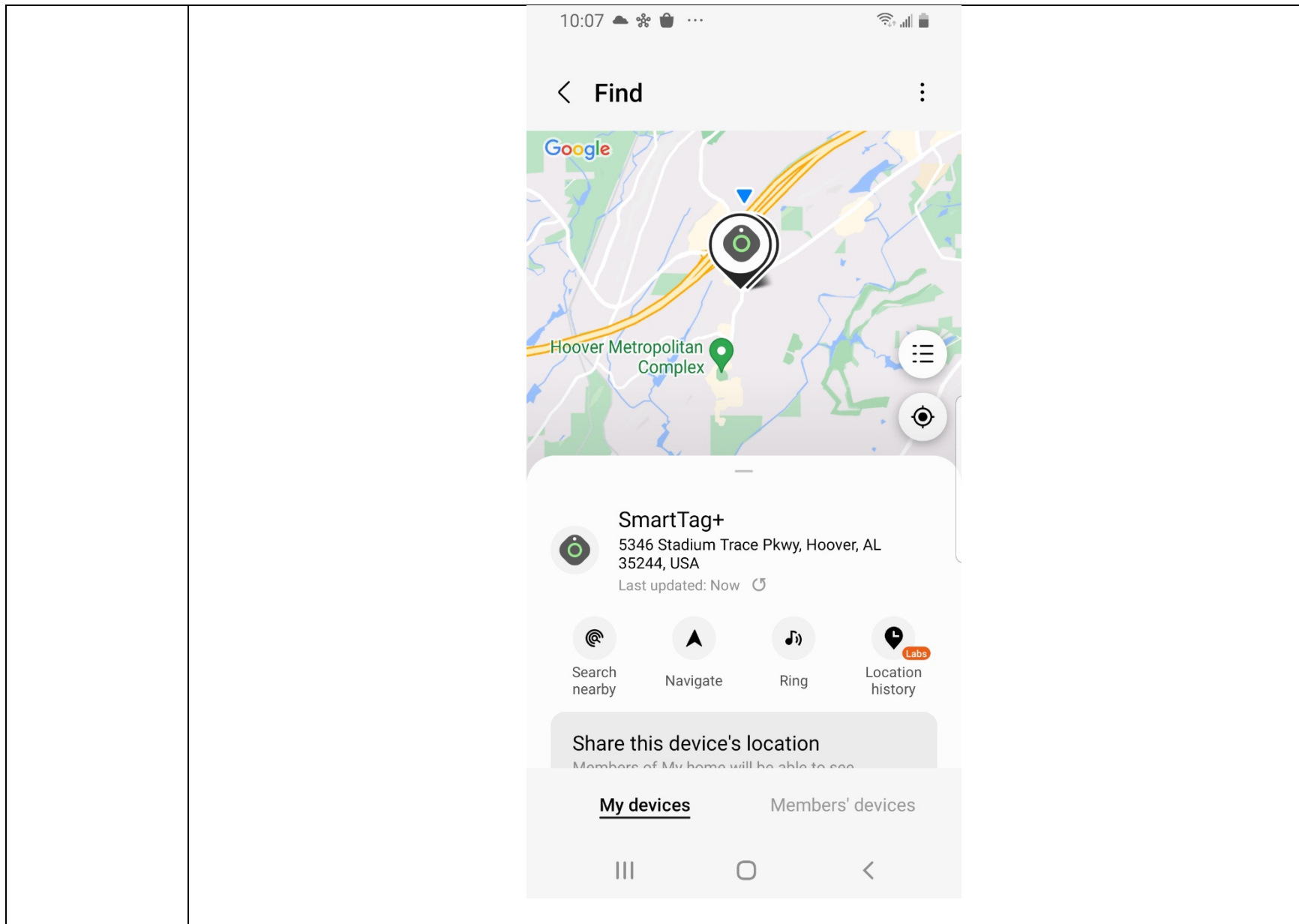
Moreover, the phone can receive notifications when a different device has spotted the tag.



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	<ul style="list-style-type: none"> • Notify when left behind - Enable this to receive a notification when the device is far away from your phone • Notify me when it's found - Enable this to get a notification when that device is anonymously detected by a member of the SmartThings Find community <p>https://support.smartthings.com/hc/en-us/articles/10863369660052-SmartThings-Find</p>
(vii) automatically present a global positioning system referenced map on the graphic display; and	Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically present a global positioning system referenced map on the graphic display.

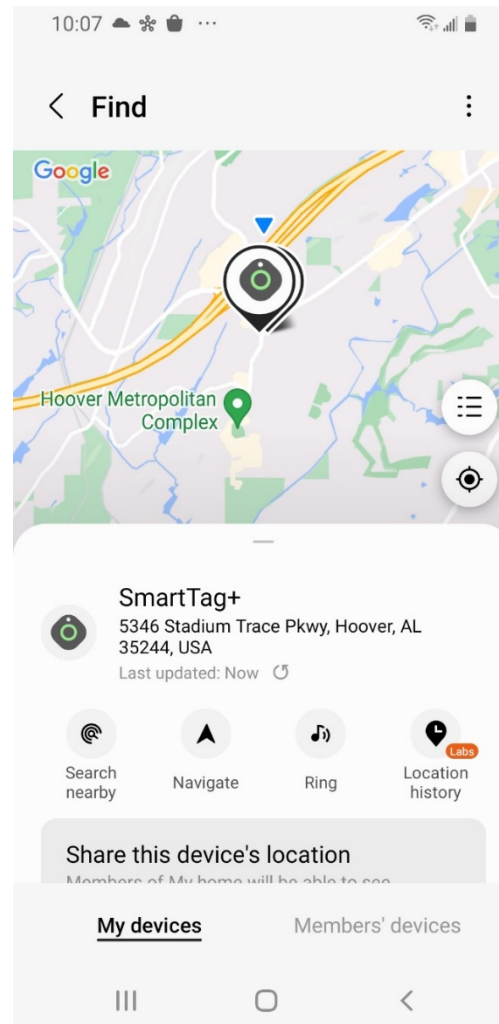
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(viii) automatically display within the global positioning system referenced map, at least the global location information of the event received through the cellular wireless transceiver from the remote automated searchable database.

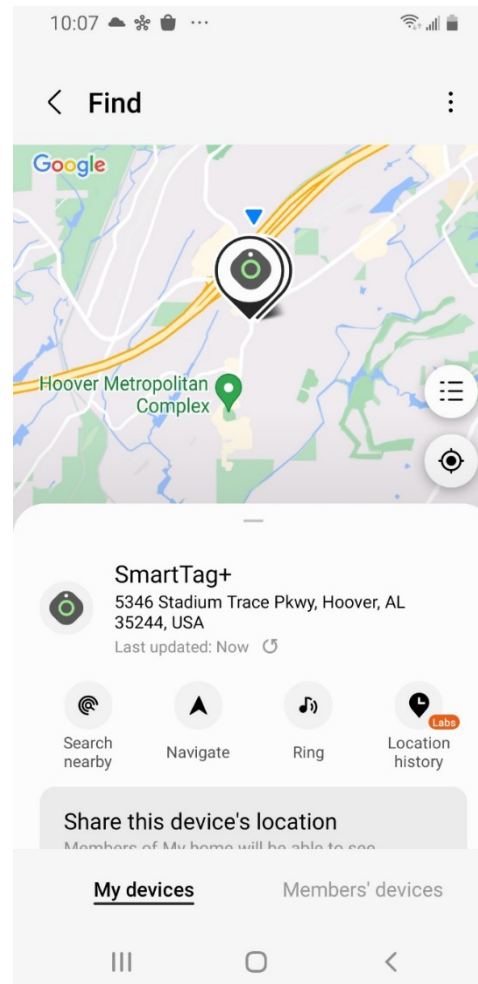
Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to automatically display within the global positioning system referenced map, at least the global location information of the event received through the cellular wireless transceiver from the remote automated searchable database.



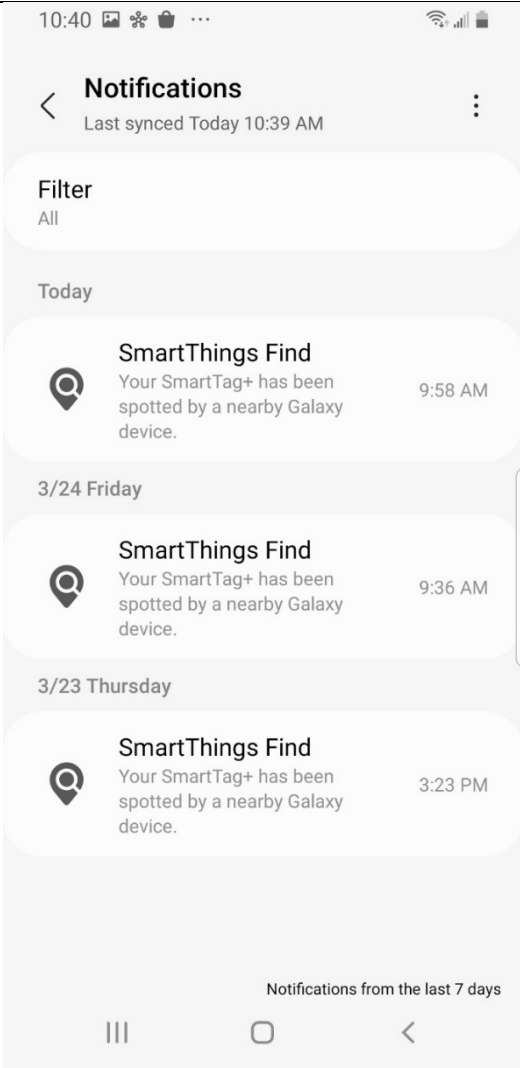
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2. The mobile phone system according to claim 1, wherein the remote automated searchable database is configured to receive a plurality of records each comprising a received identifier, along with a time and a global location of the mobile phone system determined by the global positioning system device, wherein the received plurality of records are stored in the remote automated searchable database,

As shown by the evidence cited regarding claim 1, the Samsung database is configured to receive a plurality of records each comprising a received identifier, along with a time and a global location of the mobile phone system determined by the global positioning system device, wherein the received plurality of records are stored in the remote automated searchable database, searchable by the remote automated searchable database, and retrieved as the event from the remote automated searchable database.



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<p>searchable by the remote automated searchable database, and retrieved as the event from the remote automated searchable database.</p>	
<p>3. The mobile phone system according to claim 1,</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to display the global location on the map where the adjacent mobile wireless communication device was at the time of receipt of the identifier from the adjacent mobile wireless communication device.</p>

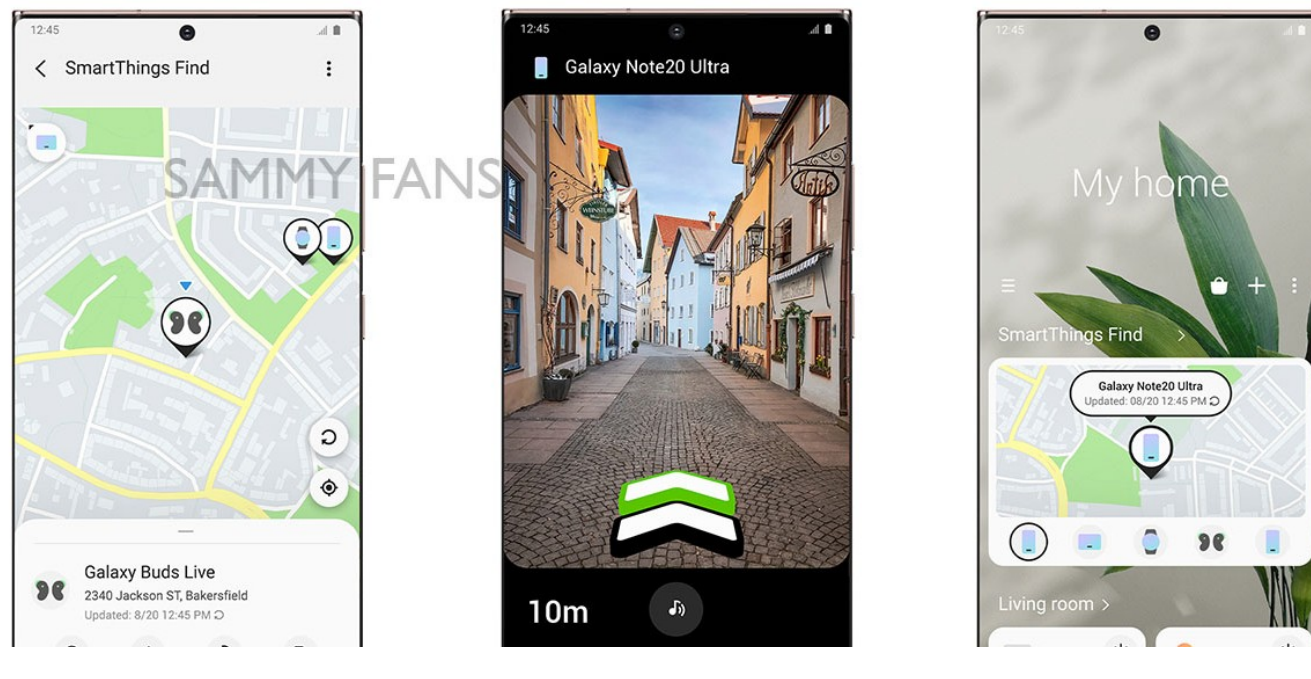
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<p>wherein the at least one automated processor is further configured to display the global location on the map where the adjacent mobile wireless communication device was at the time of receipt of the identifier from the adjacent mobile wireless communication device.</p>	<div data-bbox="493 199 846 837"> </div> <div data-bbox="980 199 1331 837"> </div> <div data-bbox="1449 199 1801 837"> </div> <p><u>Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans</u></p>
<p>4. The mobile phone system according to claim 1, wherein the at least one automated processor is further configured to perform mobile ad hoc</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to perform mobile ad hoc surveillance of phones by transmitting through the cellular wireless transceiver data from another mobile phone system received through the Bluetooth radio frequency transceiver.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p>

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surveillance of the adjacent mobile wireless communication device by transmitting through the cellular wireless transceiver data from the adjacent mobile wireless communication device received through the Bluetooth radio frequency transceiver.

Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom



Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans

“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).

SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the

Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find

	<p>"SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
5. The mobile phone system according to claim 1, wherein the Bluetooth radio frequency transceiver is configured to receive a periodically transmitted identifier of a respective adjacent mobile wireless	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include a Bluetooth radio frequency transceiver configured to receive a periodically transmitted identifier of a respective adjacent mobile wireless communication device.</p> <p>For example, on information and belief, once a device has been off-line for 30 minutes, it will periodically produce a BLE signal.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p>

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communication device.	<p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
6. The mobile phone system according to claim 1, wherein the at	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, include at least one automated processor configured to store each of a plurality of received identifiers along with a respective time and a respective determined global location of each respective received identifier.</p>

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<p>least one automated processor is further configured to store each of a plurality of received identifiers along with a respective time and a respective determined global location of each respective received identifier.</p>	<p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from</p>
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	<p>nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
7. A method for tracking a mobile device, comprising:	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method for tracking a mobile device.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Samsung offers a technology named "SmartThings Find" (see, <i>e.g.</i>, Ref. 2; Ref. 3; Ref. 4) "that helps you quickly and easily locate Galaxy devices" (Ref. 2).</p> <p>Similarly, another document explains that SmartThings Find "lets Samsung customers quickly locate registered Galaxy devices including smartphones, tablets, smartwatches and earbuds" (Ref. 4).</p>

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	<p>Furthermore, "Samsung will further expand these capabilities to tracking tags, which will help users locate their favorite items, not only for Galaxy devices, but also others as well" (Ref. 2).</p> <p>Indeed, it has been emphasized that SmartThings Find "can also locate your personal things like keys and wallet after attaching them with Galaxy SmartTag or SmartTag+" (Ref. 4).</p> <p>In short, Samsung "will also make this functionality available to tracking tags, this will help users locate their favorite items, other than Galaxy devices" (Ref. 5).</p> <p>Moreover, "On July 14 [2022], Samsung disclosed that the rapidly growing SmartThings Find service is now comprised of more than 200 million find nodes" (Ref. 4) (clarifying material in square brackets added here). It is further explained that, by definition, "Find nodes are devices that have been registered on the SmartThings Find service" (Ref. 4).</p> <p>In fact, it has been stated that "Smart[T]hings [is] one of the fastest growing services at Samsung" (Ref. 4) (clarifying material in square brackets added here).</p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung</p>
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	<p>and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
<p>automatically receiving an identification directly on a mobile device from an adjacent mobile device using a Bluetooth transceiver at a location;</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method for tracking a mobile device, comprising automatically receiving an identification directly on a mobile device from an adjacent mobile device using a Bluetooth transceiver at a location.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Samsung documentation advertises that "With the SmartThings Find service, you can easily locate your missing device even if it's offline...Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices" (excerpted from Ref. 2). As a reminder, in this context, the arrangement of letters "BLE" is an acronym for "Bluetooth Low Energy" (see, <i>e.g.</i>, Ref. 2).</p> <p>A variety of Samsung Galaxy products have Bluetooth capability. As only a few examples, it has been revealed that both the "Samsung Galaxy Note20 5G" (Ref. 1) and the "Galaxy Note20 Ultra 5G" (Ref. 1) include Bluetooth connectivity (see, <i>e.g.</i>, Ref. 1); <i>see also</i> https://www.gsmarena.com/samsung_galaxy_s22_5g-11253.php (describing the Bluetooth functionality of the Samsung Galaxy S22 5G).</p>

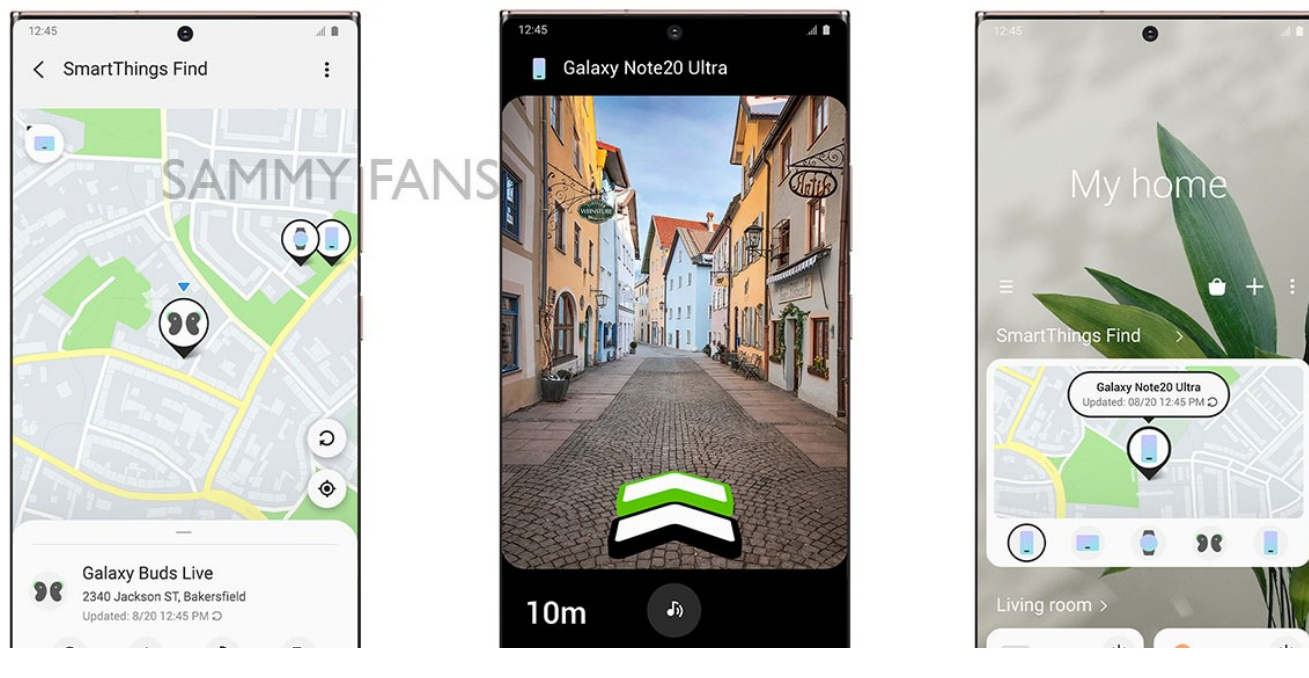
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	<p>In fact, Samsung has explained that "SmartThings Find uses Bluetooth Low Energy (BLE)...to help people find select Galaxy smartphones, tablets, smartwatches and earbuds" (excerpted from Ref. 2) (parenthetical insertion in the original).</p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" add-on which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
automatically determining the location with a GPS	Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes automatically determining the location with a GPS geolocation system.

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<p>geolocation system;</p>	<p>Easily Find More of Your Devices</p> <p>After completing a quick registration process, SmartThings users can easily find their Galaxy devices – from smartphones, tablets and smartwatches, down to each individual earbud. Whether you dropped your Galaxy Note20 Ultra behind the sofa, can't remember where you stashed your Galaxy Buds Live, or left your Galaxy Watch3 somewhere so secure you can't find it, the SmartThings Find service will help you keep more of your Galaxy devices safe through the easy-to-use SmartThings app.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>It is well-known that many Samsung Galaxy product include GPS-based location capability. For instance, Reference 6 shows how to set up a Galaxy device location modality using "GPS and Wi-Fi"; using "Wi-Fi only"; or using "GPS only."</p>
<p>automatically recording the received identification along with a time and the location at the time of the received identification;</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes automatically recording the received identification along with a time and the location at the time of the received identification.</p> <p>This is evidenced, for example, by the fact that a Samsung mobile phone can alert the Samsung server about the location of detected off-line devices.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p>

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Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans

The SmartThings Find technology reports the identification of the specific object being sought, the time that it was found, and the location that this lost object occupies (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). For instance, it has been written that "Samsung customers quickly locate registered Galaxy devices" (Ref. 4). Clearly, in order for the registration to be useful, it must necessarily include the identification of the lost object.

In addition, the SmartThings Find technology indicates the time that the object was located. For example, in a screen shot included with Reference 5, notice that the time indicated is 12:45 PM on August 20th.

And, the SmartThings Find technology indicates the location of the lost object. In the example discussed immediately above, the screen shot indicates that the location of the lost item is 2340 Jackson Street in Bakersfield.

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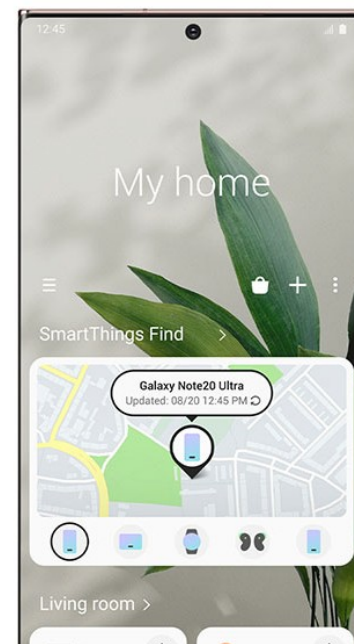
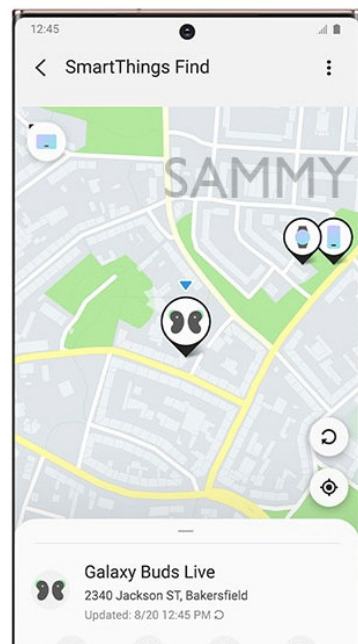
	<p>“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" add-on which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
automatically transmitting the received identification along with the time and the location to a remote automated	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes automatically transmitting the received identification along with the time and the location to a remote automated searchable database through a cellular phone connection as a respective database record.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy</p>

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searchable database through a cellular phone connection as a respective database record; and

smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.

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As detailed earlier in this patent claim chart, the SmartThings Find technology reports the identification of the specific object being sought, the time that it was found, and the location that this lost object occupies (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). For instance, it has been written that "Samsung customers quickly locate registered Galaxy devices" (Ref. 4). Clearly, in order for the registration to be useful, it must necessarily include the identification of the lost object.

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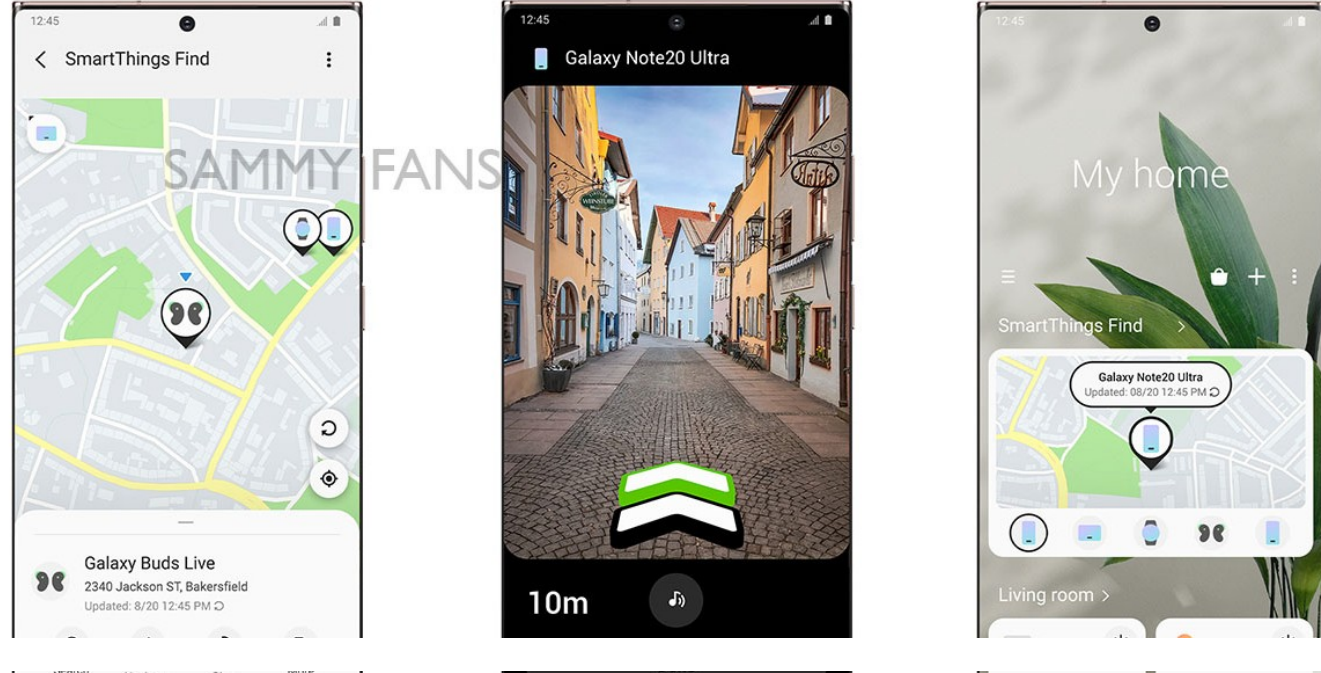
Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”

<https://arxiv.org/pdf/2210.14702.pdf>

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<p>automatically displaying an icon at a location on a map selectively dependent on a communication received from the remote automated searchable database representing a respective database record,</p>	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes automatically displaying an icon at a location on a map selectively dependent on a communication received from the remote automated searchable database representing a respective database record.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p>
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Samsung's SmartThings Find technology includes the capability to show the location on a map of the lost Galaxy device (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). In fact, in a companion document, Samsung reveals that "Your smartphone will then show you the exact location of your device on a map" (Ref. 2). And, as can be seen in, for example, the screenshots included in Ref. 3 and in Ref. 5, the requisite location is indicated with a corresponding icon at a specific map location.

Similarly, it has been stated that "Your devices will appear on a map so you can easily keep an eye on their locations" (Ref. 4). This same document reminds user that "You'll see a map containing the devices you selected" (Ref. 4).

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	<p>Further, Samsung expressly states that their SmartThings Find technology can be employed "in conjunction with maps...to guide you back to your devices" (excerpted from Ref. 2). Samsung goes on to detail that "Locating your missing device is a breeze with integrated map directions" (Ref. 2).</p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
wherein the remote automated searchable database	<p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes a remote automated searchable database that comprises a plurality of database records, each database record comprising information to search and map a respective location of a respective adjacent mobile device at a respective time it was detected by a respective mobile device.</p>

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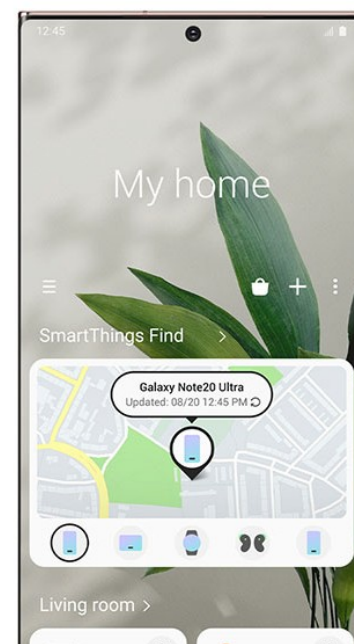
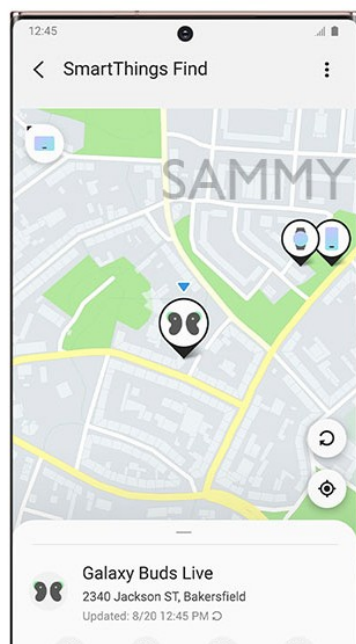
comprises a plurality of database records, each database record comprising information to search and map a respective location of a respective adjacent mobile device at a respective time it was detected by a respective mobile device.

This is evidenced, for example, by the fact that the Samsung server can map search and map the location of a detected off-line mobile device based on the location of the mobile device that detected the off-line device.

Offline Doesn't Mean "Off-The-Grid"

With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.

Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom



Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find

Samsung launched SmartThings Find service, to easily locate your missing Galaxy devices - Sammy Fans

As explained in the section associated with the claim element immediately above, Samsung's SmartThings Find technology includes the capability to show the location on a map of the lost Galaxy device (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5). Similarly, in a companion document, Samsung reveals that "Your smartphone will then show you the exact location of your device on a map" (Ref. 2).

It is also explained that "SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices...If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you" (excerpted from Ref. 2). This "Samsung server" houses the "remote automated searchable database" recited in this portion of the patent claim.

As detailed earlier in this patent claim chart, the SmartThings Find technology reports the identification of the specific object being sought, the time that it was found, and the location that this lost object occupies (see, *e.g.*, screenshots included in Ref. 3 and in Ref. 5).

In particular, the SmartThings Find technology indicates the time that the object was located. For example, in a screen shot included with Reference 5, notice that the time indicated is 12:45 PM on August 20th. And, the SmartThings Find technology indicates the location of the lost object. In the example discussed immediately above, the screen shot indicates that the location of the lost item is 2340 Jackson Street in Bakersfield.

"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).

SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices

Preliminary comparison of U.S. Patent No. 11,308,156 to Samsung SmartThings Find

	<p>in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
8. The method according to claim 7, wherein the mobile device comprises a graphic display, further comprising displaying a location where the adjacent mobile device was detected on the map.	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes a graphic display, further comprising displaying a location where the adjacent mobile device was detected on the map.</p> <p>Samsung's SmartThings Find technology includes the capability to show the location on a map of the lost Galaxy device (see, <i>e.g.</i>, screenshots included in Ref. 3 and in Ref. 5). In fact, in a companion document, Samsung reveals that "Your smartphone will then show you the exact location of your device on a map" (Ref. 2). And, as can be seen in, for example, the screenshots included in Ref. 3 and in Ref. 5, the requisite location is indicated with a corresponding icon at a specific map location.</p>

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	<p>Similarly, it has been stated that "Your devices will appear on a map so you can easily keep an eye on their locations" (Ref. 4). This same document reminds user that "You'll see a map containing the devices you selected" (Ref. 4).</p> <p>Further, Samsung expressly states that their SmartThings Find technology can be employed "in conjunction with maps...to guide you back to your devices" (excerpted from Ref. 2). Samsung goes on to detail that "Locating your missing device is a breeze with integrated map directions" (Ref. 2).</p>
<p>9. The method according to claim 7, further comprising performing mobile ad hoc surveillance of an adjacent mobile device by transmitting through the cellular phone connection, to the remote automated searchable database, data from the adjacent mobile device received through the Bluetooth transceiver.</p>	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes performing mobile ad hoc surveillance of an adjacent mobile device by transmitting through the cellular phone connection, to the remote automated searchable database, data from the adjacent mobile device received through the Bluetooth transceiver.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p>

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	<p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>“In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p> <p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices.”</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
10. The method according to claim 7, wherein the Bluetooth transceiver	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the</p>

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<p>receives the identification as a periodic transmission from the adjacent mobile devices.</p>	<p>functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>On information and belief, Samsung mobile phones, such as the Samsung Galaxy S22 5G, utilize a method that includes the Bluetooth transceiver receiving the identification as a periodic transmission from the adjacent mobile devices.</p> <p>For example, on information and belief, when a Samsung device has been offline for 30 minutes, it periodically produces a BLE signal that is, in turn, periodically received by nearby Samsung devices.</p> <p>Offline Doesn't Mean "Off-The-Grid"</p> <p>With the SmartThings Find service, you can easily locate your missing device even if it's offline.⁷ That's because SmartThings users can now opt in to securely use their Galaxy smartphone or tablet to help others locate their lost devices. Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices. If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location, which will in turn notify you. All SmartThings Find user data is encrypted and securely protected, ensuring that the device's location is not revealed to anyone except its owner.</p> <p><u>Samsung Launches SmartThings Find, a New Way To Quickly and Easily Locate Your Galaxy Devices – Samsung Global Newsroom</u></p> <p>Samsung documentation advertises that "With the SmartThings Find service, you can easily locate your missing device even if it's offline...Once a device has been offline for 30 minutes, it produces a BLE signal that can be received by other devices" (excerpted from Ref. 2). As a reminder, in this context, the arrangement of letters "BLE" is an acronym for "Bluetooth Low Energy" (see, <i>e.g.</i>, Ref. 2).</p> <p>"In 2021, Samsung released the Galaxy SmartTag, which is a small BLE tracker that can be attached to various items, such as bags, keys, etc., to keep track of their locations and to find them when lost. Unlike smart phones or tablets, SmartTags are designed exclusively to be used as a tracking device, with no internet connectivity. So they rely crucially on the Offline Finding (OF) network to allow for long range location tracking (outside the range of BLE).</p>
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	<p>SmartTags are registered and controlled through SmartThings, which is an umbrella control and management platform for a large variety of smart devices and home appliances. OF is also supported for SmartTags using the "SmartThings Find" addon which works in conjunction with Find My Mobile (FMM). At a basic level, devices in Samsung's OF network can be categorized into three roles: the owner device, the finder device, and the lost device. A mobile device can be registered to the Samsung OF network through the FMM app, while a SmartTag can be registered through Samsung SmartThings app.</p> <p>Each registered device is linked to the owner account under which it was registered from. When a registered device loses internet connectivity, or in the case of SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically. This data contains a rotating identifier, called the privacy ID, which is unique to the lost device and which, in theory, can only be linked to its owner by Samsung and the owner device. The finder devices consist of both Samsung devices (phones and tablets), and some third parties' devices with FMM enabled. An active finder device periodically scans for BLE advertisements from nearby FMM devices and reports the locations of those devices to a Samsung's server. The location reports of the lost devices will be downloaded onto the owner device when the owner queries the locations of their lost devices."</p> <p>https://arxiv.org/pdf/2210.14702.pdf</p>
11. The method according to claim 7, wherein the remote automated searchable database is a centralized community search database.	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>Any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location. "When a registered device loses internet connectivity, or in the case of</p>

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	<p>SmartTags, when it is out of the BLE range from its owner device, it broadcasts certain data over BLE periodically." https://arxiv.org/pdf/2210.14702.pdf.</p> <p>Samsung has also revealed that "If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location" (Ref. 2). This "Samsung server" houses the "remote automated searchable database" recited in this portion of the patent claim.</p> <p>And, the above-listed "Samsung server" is "centralized" as recited in this patent claim.</p> <p>Furthermore, the other users that have "opted into helping find misplaced devices" (Ref. 2) constitute the population of the "community search database" recited in this portion of the patent claim.</p>
12. The method according to claim 7, wherein the remote automated searchable database is configured to receive identifications from a plurality of mobile devices.	<p>On information and belief, Defendant performs all steps of this claim or, alternatively, to the extent a user performs any step, Defendant conditions the user's use of the Defendant's accused instrumentalities on the performance of that step as disclosed herein. For example, on information and belief, a user cannot use the accused instrumentality as described in this claim chart without performance of the steps recited in this claim. By providing the functionality of the accused instrumentality as described herein, Defendant also controls the manner and/or timing of the functionality described in this claim chart. In other words, for a user to utilize the functionality described in this claim chart, the steps of this claim must be performed in the manner described herein. Without performance of the steps as described herein, the Defendant's functionality will not be available to users.</p> <p>Samsung has revealed that "If you report your device as lost via SmartThings Find, any nearby Galaxy smartphone or tablet that has opted into helping find misplaced devices can alert the Samsung server about its location" (Ref. 2). This "Samsung server" houses the "remote automated searchable database" recited in this portion of the patent claim.</p> <p>Furthermore, the other users that have "opted into helping find misplaced devices" (Ref. 2) constitute the population of the "community search database" recited in this portion of the patent claim.</p>

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